Amendments to the Specification:

Please replace the paragraph beginning at page 2, line 9, with the following rewritten paragraph:

The method and apparatus of the present invention does not require the use of ~~FlashCorrelation®~~ flash correlation. However, that technique provides a computationally simple and therefore rapid capability for decoding the two-dimensional encodings of data which provide authentication. Furthermore, ~~FlashCorrelation®~~ flash correlation is fast enough to exhaustively consider all possibilities when certain encoded information is unknown, such as the ID of the specific camera used, the ID of the user, or the frame number or exact time of day a given image was taken. Alternately, steganography can be used.

Please replace the paragraph beginning at page 2, line 21, with the following rewritten paragraph:

Presence of a ~~Flash Correlation® Artifact~~ flash correlation artifact (FCA) between a Resultant Image and an encrypted representation of the Encoded Data Array is sufficient to identify its date/time, location, and source. Each of those values can be separately identified, or all can be simultaneously verified. Presence of an FCA between a Resultant Image and an Encrypted version of the Original Image indicates that

the Resultant Image is authentic, It is not necessary to decrypt the Resultant Image or to perform pixel by pixel comparison in order to authenticate the image. Authentication of an image can be performed in one operation, regardless of the complexity of the image.

Please replace the paragraphs in the section "SUMMARY OF THE PRIOR INVENTION" beginning at page 3, line 15, and continuing to page 5, line 2, with the following rewritten paragraphs:

SUMMARY OF THE PRIOR INVENTIONS

~~"Flash Correlation®"~~ The term "flash correlation" refers to the instantaneous indication of massive correlation between two or more images through the process of overlaying two images, with one rotated and either inverted or not inverted with respect to the other, so as to produce a region with density statistically higher or lower than the rest of the overlaid image area, when and only when there is sufficient similarity between the two images. The two images may be scrambled prior to being overlaid in order to produce a more uniform density distribution. When pixelized images are so scrambled and there is strong correlation between the two images, the resulting ~~FlashCorrelation® Artifact~~ flash correlation artifact will be a square centered at the point of rotation.

~~Flash Correlation® Artifact~~ The term "flash correlation artifact" (FCA) means a region of statistically different density, which may be repositioned within the overlaid area by relative

translation of the two overlaid patterns having relative rotation. The existence of the FCA or flash correlation artifact serves to: authenticate that an unknown pattern is included within a set of known images and identify matches between unknown and known specific images. Analysis of the FCA density provides a quantitative measure of the correlation between any two images.

The use of ~~FlashCorrelation®~~ flash correlation-generated patterns for authentication of documents and other images was included in patent 5,583,950 point of novelty # 21. "By utilizing either pseudorandom-generated patterns, or read-after-write random patterns, ~~FlashCorrelation®~~ flash correlation offers the ability to overlay additional patterns as an item advances through a manufacturing or distribution cycle. The total composite pattern, or any of the subpatterns can subsequently be authenticated or identified."

In the present invention, the Encoded Data Array may be added to the Original Array either before or after encryption. If before, then the Resultant Array must be decrypted prior to using ~~FlashCorrelation®~~ flash correlation to authenticate the image and decode the data. This makes the image available in the clear during authentication and decoding. If the Encoded Data Array is added after encryption, then ~~FlashCorrelation®~~ flash correlation can be used to authenticate the image and decode the data without decrypting the image.

Please replace the paragraph beginning at page 8, line 23, with the following rewritten paragraph:

Entities which are not users of the imagery may independently provide authentication services, which might include providing cameras, and analyzing Resultant Imagery. These entities or persons may serve as expert witnesses to testify to the authenticity of the Resultant Imagery, and explain the procedures in evidentiary proceedings. These persons are called "Certifiers". Among their duties is determining the precision of the location and time information encoded on an image, and the statistical level of confidence in asserting that an image has or has not been modified; that is, that it is or is not an authentic original taken at the encoded time and location by a particular camera and user.

Please replace the paragraph beginning at page 10, line 1, with the following rewritten paragraph:

Rather than a camera, the EIS may use another source, such as a scanner or computer software which produces a document or image. The output of this source is input to the EIS in place of the camera input. The EIS may be a component of a secure computer network and be automatically triggered by operations to a document or image such as; saving, transmission, printing, or duplication. The EIS Encoded Data Array would include a code which represents the terminal or workstation which originated the work or which is transmitting it. The

work may have previously been encoded with other date, time, and source. Multiple sets of encoded layers may be applied without affecting the accuracy of the authentication. That ability to overlay and separately readout multiple layers is an important advantage of ~~FlashCorrelation®~~ flash correlation.

Please replace the paragraph beginning at page 13, line 23, with the following rewritten paragraph:

The present invention, however, offers the novelty of utilizing GPS and GMT receivers for automatic determination of time and location which is not prone to human error or manipulation. It also offers the preferred use of ~~FlashCorrelation®~~ flash correlation for rapid readout and authentication of all encoded information, or of any one or more elements. That provides the capability to separately control who has the ability to determine certain information about received images.

Please replace the paragraphs in the section "BRIEF DESCRIPTION OF THE DRAWINGS" beginning at page 15, line 22, and continuing to page 15, line 30, with the following rewritten paragraphs:

Figures 8a and 8b illustrate the +/+ and +/- ~~FlashCorrelation®~~ flash correlation, respectively, of a date/time encoding and the encoded image.

Figures 9a and 9b illustrate the +/+ FCA and +/- FCA between the encoded image and the encoding formed of the date/time and location information. Figure 9c illustrates the +/- FCA when the encoded image is ~~FlashCorrelated~~ flash correlated with an encoding formed from the date/time, location, camera ID, and frame #.

Please replace the paragraph beginning at page 20, line 29, with the following rewritten paragraph:

The authenticator 706 compares the encoding obtained from the annotation information, or each possible encoding, to the encoded image using ~~FlashCorrelation®~~ flash correlation or other comparison technique. If there is adequate correlation between the encoding and the encoded image, the image is judged to be authentic and that decision 708 is output. If there is not adequate correlation, that decision 708 is also output. The image decoder and restoration processor 709 is a dedicated processor or software routine which removes the encoding from the image and restores pixels which have become voids in the process. The resultant image is made available in the restored image buffer 710 to be transmitted, stored, or output 711, along with the authentication certificate.

Please replace the paragraph beginning at page 21, line 15, with the following rewritten paragraph:

Figure 8a illustrates the +/+ ~~FlashCorrelation®~~ flash correlation of a date/time encoding and the encoded image. The presence of the rings ~~FlashCorrelation®~~ flash correlation artifact (+/+ FCA) indicates that date/time encoding was used to form the encoded image. The fact that the rings extend everywhere indicate that there has been no modification to the encoded image in any part of the image. Figure 8b illustrates the +/- ~~FlashCorrelation®~~ flash correlation of the same date/time encoding and encoded image. The presence of the high density spot ~~FlashCorrelation®~~ flash correlation artifact (+/- FCA) in the center indicates that date/time encoding was used to form the encoded image.

Please replace the paragraph beginning at page 22, line 7, with the following rewritten paragraph:

Figures 9a and 9b illustrate the +/+ FCA and +/- FCA between the encoded image and the encoding formed of the date/time and location. The presence of the FCAs indicates that both the date/time and location used to form this encoding were the same ones used in the imaging system. Figure 9c illustrates the +/- FCA when the encoded image is ~~FlashCorrelated~~ flash correlated with an encoding formed from the date/time, location, camera ID, and frame #. The presence of the FCA indicates that all those parameters chosen for the decoder match the same values used in the imaging system.

Please replace the paragraph beginning at page 25, line 4, with the following rewritten paragraph:

A Fourth Embodiment is an evidentiary imaging system with provision for determining that a given image was in fact produced by a particular camera at a particular location and time, and that the image has not been altered. Each data item: camera ID, location, date, and time can be separately confirmed by a search for an FCA when the encoding of that data item is ~~flashcorrelated~~ flash correlated against the Resultant Image. For the image to be authentic and not altered, the Resultant Image and each of the Encoded Data Arrays is divided into cells, and each pair of corresponding cells is ~~flashcorrelated~~ flash correlated. A perfect or at least strong FCA, depending upon the level of system noise to be tolerated, must occur for each cell. Multiple iterative tests can be performed by varying the FCA parameters, in particular the angle of rotation between the encoding image and the Resultant image. Since ~~FlashCorrelation®~~ flash correlation is a sampling technique, use of a range of parameters for testing authenticity helps to defeat adversaries who would attempt to make minor pixel-by-pixel modifications to an encoded image, hoping that their minor modifications would not be significant enough to be discovered.